

CURRICULUM VITAE

SANDRA PERREIRA CHANG

Professor, Tropical Medicine

BORN: 6 December 1951, Lihue, Hawaii

SEX: Female

NATIONALITY: U.S.A.

Married, two children.

EDUCATION:

Sacred Hearts Academy	High School	1969	
University of Hawaii	B.S.	1973	Biology
University of Hawaii	M.S.	1977	Microbiology
Oregon Health Sciences University	Ph.D.	1983	Microbiology & Immunology

MEMBERSHIPS:

Sigma Xi Scientific Research Society
American Society of Microbiology
American Society of Tropical Medicine and Hygiene
American Association of Immunologists
American Association for the Advancement of Science
Hawaii Academy of Science

MAJOR RESEARCH INTERESTS:

Regulation of the immune response to microbial pathogens, particularly *Plasmodium falciparum*, *Mycobacterium tuberculosis* and dengue virus; development of subunit vaccines for malaria and other microbial pathogens; molecular genetic and immunological studies of *Plasmodium* antigens; molecular genetic studies of *M. tuberculosis* drug resistance; immunopathogenesis of dengue hemorrhagic fever and shock syndrome

AREAS OF EXPERTISE:

Immunology, malaria vaccine development, molecular biology, microbiology, parasitology

RESEARCH AND PROFESSIONAL EXPERIENCE:

1997-present	Professor, Department of Tropical Medicine and Medical Microbiology, John A. Burns School of Medicine, University of Hawaii.
2000-present	Editorial Board Member, Infection & Immunity, American Society for Microbiology.
2003-present	Malaria Vaccine Advisory Committee (MALVAC) Member, World Health Organization Initiative for Vaccine Research (IVR), Geneva.
1998-present	Medical Research Review Board Member, Hawaii Community Foundation, Honolulu.
1996-1999	Laboratory Technical Director & Supervisor, Division of Infectious Disease, Department of Tropical Medicine and Medical Microbiology, John A. Burns School of Medicine, University of Hawaii.
1995-1997	Associate Professor, Department of Tropical Medicine and Medical Microbiology, John A. Burns School of Medicine, University of Hawaii.
1988-1995	Associate Researcher, Department of Tropical Medicine and Medical Microbiology, John A. Burns School of Medicine, University of Hawaii.

1986-1988	Assistant Researcher, Department of Tropical Medicine and Medical Microbiology, John A. Burns School of Medicine, University of Hawaii.
1988-present	Graduate Faculty, Cell & Molecular Biology graduate program, interdisciplinary, John A. Burns School of Medicine, University of Hawaii.
1999-present	Cooperating Graduate Faculty, Microbiology graduate program, Department of Microbiology, College of Natural Sciences, University of Hawaii.
2002-present	Cooperating Graduate Faculty, Molecular Biosciences & Biosystems Engineering graduate program, Department of Molecular Biosciences & Biosystems Engineering, College of Tropical Agriculture & Human Resources, University of Hawaii.
1983-1986	Postdoctoral Fellow, California Institute of Technology.
1977-1983	Research and Teaching Trainee, Oregon Health Sciences University.
1973-1977	Research Associate, Department of Pathology, John A. Burns School of Medicine, University of Hawaii.

HONORS, AWARDS:

BS degree granted with high honors, 1973

American Society for Microbiology, Hawaii Division, Student Research Award, 1976

American Society of Zoologists, Division of Comparative Immunology Best Student Paper Award, 1980

N.L. Tartar Research Fellowship, 1978 and 1981

Proctor and Gamble Postdoctoral Fellowship, 1983-1984

Damon Runyon-Walter Winchell Cancer Fund Postdoctoral Fellowship, 1984-1986

Distinguished Alumnae Award, Sacred Hearts Academy, 2001.

Individual Achievement Award, Scientific Research, Lapu-Lapu Awards, Congress of Visayan Organizations, 2002.

GRANTS & CONTRACTS:

University of Hawaii Research and Training Revolving Fund Seed-Money Award (7/16/86 - 4/30/87), "Cloning and Expression of Malaria Blood Stage Antigens", Principal Investigator.

NIH First Independent Research Support & Transition Award (7/1/89 - 6/30/94), "B cell and T cell Recognition Sites of *P. falciparum* Gp195", Principal Investigator.

USAID Cooperative Agreement (7/1/89 - 6/30/92), "Malaria Immunity and Vaccination: Studies Toward the Development of a Blood-Stage *Plasmodium falciparum* Vaccine Using Parasite Gp195, Recombinant Gp195 Polypeptides and Synthetic Adjuvants", Principal Investigator (effective 7/1/90).

USAID Cooperative Agreement (7/1/92 - 6/30/95), "Recombinant gp195 and synthetic adjuvant malaria vaccine", Principal Investigator.

University of Hawaii Research and Training Revolving Fund Award (1/3/95 - 12/31/95), "Optimization of an MSP-1 Malaria Vaccine", Principal Investigator.

Victoria S. and Bradley L. Geist Foundation (7/5/95 - 7/4/98), "Development of a Human Malaria Vaccine", Principal Investigator.

World Health Organization, Special Programme for Research and Training in Tropical Diseases, Collaborative Research Project (12/15/95 - 11/15/01), "Development of a MSP-1 Malaria Vaccine", Principal Investigator.

University Seed Capital Program, Office of Technology Transfer and Economic Development, (1/29/96-3/31/99), "Evaluation of a Human Malaria Vaccine in the Aotus Monkey Model", Principal Investigator.

VIP Grant, Hawaii Institute of Tropical Agriculture and Human Resources, (11/1/97 - 9/30/98), "Bioengineering plant cells as a new source of human malaria vaccine", Project Leader (along with W. W. Su and D. A. Christopher).

Victoria S. and Bradley L. Geist Foundation, (07/01/98 - 06/30/99), "Intracellular cytokine production by peripheral blood mononuclear cells in response to *P. falciparum* MSP1 from individuals in a malaria endemic area", Principal Investigator.

Victoria S. and Bradley L. Geist Foundation, (11/01/98 - 01/31/00), "Bioengineering plants as a new source of a human malaria vaccine", Principal Investigator.

Hawaii'i Community Foundation (10/1/98 - 12/31/99), "Selective expansion and deletion of T cell receptor V beta 6 bearing lymphocytes in active tuberculosis". Co-investigator.

Leahi Foundation (1/1/99 - 12/31/00), "Genetic basis of *M. tuberculosis* drug resistance in Hawaii", Principal Investigator.

United States Department of Education, Graduate Assistance in Areas of National Need Program (08/15/00 - 08/14/03), "Interdisciplinary Graduate Training in Biology and Engineering", Principal Investigator.

NIH, NIAID, STTR Phase I Program (03/01/01 - 02/28/04), "Large scale production and evaluation of a malaria recombinant protein." Collaboration between University of Hawaii and Antigenics, Inc., Principal Investigator.

Victoria S. and Bradley L. Geist Foundation (01/01/03 - 12/31/05), "Utilizing the yeast two-hybrid (Y2H) system to define specific interactions between *Plasmodium falciparum* merozoite surface protein-1.42 (MSP-1.42) and host cell proteins and identify novel targets for drug and vaccine development." Principal investigator.

Hawaii Community Foundation and Victoria S. and Bradley L. Geist Foundation ((06/01/03 to 05/31/05), "Evaluation of Biomarkers of Severe Dengue Infection." Principal investigator.

PATENTS:

"Malaria Recombinant Poxvirus Vaccine," United States Patent No. 5,756,101, Inventors: E. Paoletti, C. de Taisne, S. Chang, G. Hui and W. Siddiqui, patent issued 5/26/98.

"Baculovirus Produced Plasmodium Falciparum Vaccine," United States Patent No. 6,420,523, Inventors: S. Chang, G. Hui, P. Barr, H. Gibson, patent issued 7/16/02.

Continuation-in-part for "Baculovirus Produced Plasmodium Falciparum Vaccine," United States Patent Application No. 10/062,809, filed 2/1/02, Inventors: S.P. Chang, K.J. Kramer, W.L. Gosnell, T. Nishimura, (pending).

"A P. falciparum Merozoite Surface Protein-1 Malaria Vaccine Produced in Transgenic Plants,"
Inventors: S. Chang, B. Vine, W-W Su, R. Bugos (pending).

SERVICE:

Student Standing and Promotion Committee, John A. Burns School of Medicine, 1998 to present.
Chairperson, 2002 to present.

University of Hawaii Patent and Copyright Committee, University of Hawaii at Manoa, 1992 to present.

Medical Research Advisory Committee, Hawaii Community Foundation, 1997 to present.

President's Diversity and Equity Initiative Committee, University of Hawaii at Manoa, 2000 to present.

Medical School Admissions Committee, John A. Burns School of Medicine, 1995 to 1998.

Standing Committee on Research, John A. Burns School of Medicine, 1989-1993.

LCME Subcommittee on Graduate and Basic Science Research, 1990.

Imi Ho'ola Adviser's Committee, 1991-1993.

Committee on Graduate Education, John A. Burns School of Medicine, 1991.

Scientific Reviewer, Research Grants Council, Hong Kong, China, 1999 to present

Scientific Reviewer for American Journal of Tropical Medicine and Hygiene journal, 1990 to present.

Scientific Reviewer for Infection and Immunity journal, American Society for Microbiology, 1996 to present.

Editorial Board, Infection and Immunity journal, American Society for Microbiology, 2000 to present.

World Health Organization/Initiative for Vaccine Research, Malaria Vaccine Advisory Committee, 2003 to present.

NIH Special Review Committee for RFA: Enhancing Vaccine Immunogenicity, 6/29-7/1/92.

Veterans Administration Merit Review Board for Infectious Diseases, 1993-1996.

NIH Special Review Committee for RFA: Tropical Disease Research Units, 11/30-12/2/94.

Local Conference Coordinator, US-JAPAN Immunology Board Meeting, National Institute of Allergy and Infectious Disease, Dec. 9-10, 1996.

Board of Directors, Hawaii Youth Opera Chorus, 1998 to present.

NIH Special Review Committee for RFA: Malaria Vaccine Development: Understanding Malaria Anemia and RFA: International Malaria Research Training Program Award, 11/1-2/01.

PUBLICATIONS:

1. Hokama, Y., Kimura, L.H., Kobara, T., Perreira (Chang), S., Su, D.W.P., Torikawa, C. and Oishi, N. 1974. Variation in peroxisomal enzyme levels of peripheral leukocytes of human cancer patients. Cancer Res. 34:2784-2789.

2. Kimura, L.H., Ignacio, C.R.M., Chang, S.P., Young, T.S.F. and Hokama, Y. 1974. CRP and phospholipase C effect on DNA synthesis of leukocytes stimulated with mitogens. *J. Reticuloendothel. Soc. Suppl.* 16:21a.
3. Chang, S.P., Hokama, Y., Masaki, D., Abad, M.A., Fischer, G.W., Crumrine, M.H. and Balk, M.W. 1976. Regulation of mitogen response and Ehrlich ascites tumor growth by miconazole. *Fed. Proc.* 35:810.
4. Fischer, G.W., Crumrine, M.H., Balk, M.W., Chang, S.P. and Hokama, Y. 1977. Immunopotential in a herpes virus model: An overview. *In: Immune Modulation and Control of Neoplasia by Adjuvant Therapy*, ed. M.A. Chirigos, Raven Press, New York, pp. 107-114.
5. Fischer, G.W., Crumrine, M.H., Balk, M.W., Chang, S.P., Hokama, Y., Heu, P. and Chou, S.C. 1978. Effect of levamisole on suckling rat spleen cells. Evidence for macrophage regulation. *In: Immune Modulation and Control of Neoplasia by Adjuvant Therapy*, ed. M.A. Chirigos, Raven Press, New York, pp. 75-83.
6. Chang, S.P. and Rittenberg, M.B. 1980. Heterogeneity of memory to phosphorylcholine. *American Zoology* 20(4):864.
7. Golding, B., Chang, S.P. and Rittenberg, M.B. 1980. Human primary *in vitro* hapten specific antibody responses. *Fed. Proc.* 39(pt. II):4718.
8. Chang, S.P. and Rittenberg, M.B. 1981. Immunologic memory to phosphorylcholine *in vitro*. I. Asymmetric expression of clonal dominance. *J. Immunol.* 126:975-980.
9. Golding, B., Chang, S.P., Golding, H., Jones, R., Pratt, K., Burger, D.R. and Rittenberg, M.B. 1981. Human lymphocytes can generate thymus independent as well as thymus dependent anti-hapten plaque-forming cell response *in vitro*. *J. Immunol.* 127:220-224.
10. Chang, S.P., Brown, M. and Rittenberg, M.B. 1982. Immunologic memory to phosphorylcholine. II. PC-KLH induces two antibody populations that dominate different isotypes. *J. Immunol.* 128:702-706.
11. Chang, S.P., Brown, M. and Rittenberg, M.B. 1982. Unequal expression of two antibody populations by various isotypes in antiphosphorylcholine memory. *Fed. Proc.* 41:367.
12. Chang, S.P., Brown, M. and Rittenberg, M.B. 1982. Immunologic memory to phosphorylcholine. III. IgM includes a fine specificity population distinct from TEPC 15. *J. Immunol.* 129:1559.
13. Chang, S.P., Perlmutter, R.M., Brown, M., Heusser, C.H., Hood, L. and Rittenberg, M.B. 1984. Immunologic memory to phosphorylcholine. IV. Hybridomas representative of Group I (T15-like) and Group II (non-T15-like) antibodies utilize distinct V_H genes. *J. Immunol.* 132:1550.
14. Todd, I., Chang, S.P., Perlmutter, R.M., Aebersold, R., Heusser, C.H., Hood, L. and Rittenberg, M.B. 1984. Immunologic memory to phosphorylcholine. V. Hybridomas representative of Group II antibodies utilize V_{K1-3} genes. *J. Immunol.* 132:1556.
15. Perlmutter, R.M., Kearney, J.F., Chang, S.P., and Hood, L.E. 1985. Developmentally controlled expression of immunoglobulin V_H genes. *Science* 227:1597.
16. Rittenberg, M.B., Glanville, R.W., Aebersold, R.H., Chang, S.P. and Brown, M. 1986. Immunologic memory to phosphorylcholine (PC). VIII. Expression of the V_H -12 gene product in the response to PC-keyhole limpet hemocyanin. *Eur. J. Immunol.* 16:503-507.
17. Siddiqui, W.A., Tam, L.Q., Kramer, K.J., Hui, G.S.N., Case, S.E., Yamaga, K.M., Chang, S.P., Chan, E.B.T. and Kan, S.C. 1987. Merozoite surface coat precursor protein completely protects *Aotus* monkeys against *Plasmodium falciparum* malaria. *Proc. Natl. Acad. Sci. USA* 84:3014-3018.

18. Chang, S.P., Kramer, K.J., Yamaga, K.M., Kato, A., Case, S. E., and Siddiqui, W.A. 1988. *Plasmodium falciparum*: Gene structure and hydropathy profile of the major merozoite surface antigen (gp195) of the Uganda Palo Alto isolate. *Exp. Parasitol.* 67:1-11.
19. Chang, S.P., Kramer, K.J., Barr, P., Hui, G., Yamaga, K., Kato, A., Case, S., and Siddiqui, W.A. 1988. The Major Merozoite Surface Antigen, Pf195. in "Exoerthrocytic and asexual blood-stage antigens of human malaria parasites: Report of the tenth meeting of the scientific working group on the immunology of malaria.", World Health Organization, Geneva. TDR/IMMAL/SWG(10)/88.3, pp. 28-30.
20. Chang, S.P., Hui, G.S.N., Kato, A., and Siddiqui, W.A. 1989. Generalized immunological recognition of the major merozoite surface antigen (gp195) of *Plasmodium falciparum*. *Proc. Natl. Acad. Sci. USA* 86:6343-6347.
21. Hui, G.S.N., Chang, S.P., Tam, L.Q., Kato, A., Case, S.E., Hashiro, C., Kotani, S., Shiba, T., Kusumoto, S and Siddiqui. 1989. Characterization of antibody responses induced by different synthetic adjuvants to the *Plasmodium falciparum* major merozoite surface precursor protein, gp195. In *Vaccine 90*, eds Chanock, R.M., Lerner, R.A., Brown, F., and Ginsberg, H. Cold Spring Harbor Laboratory, N.Y. pp. 477-484.
22. Hui, G.S.N., Tam, L.Q., Chang, S.P., Case, S.E., Hashiro, C., Siddiqui, W.A., Shiba, T., Kusumoto, S. & Kotani, S. 1991. Synthetic low-toxicity muramyl dipeptide and monophosphoryl lipid A replace Freund's Complete Adjuvant in inducing growth-inhibitory antibodies to the *Plasmodium falciparum* major merozoite surface protein, gp195. *Infect. Immun.*, 59:1585-1591.
23. Hui, G.S.N., Chang, S.P., Gibson, H., Hashimoto, A., Hashiro, C., Barr, P.J., and Kotani, S. 1991. Influence of adjuvants on the antibody specificity to the *Plasmodium falciparum* major merozoite surface protein, gp195, *J. Immunology*, 147:3935-3941.
24. Hui, G.S.N., Hashimoto, A. and S.P. Chang. 1992. Role of conserved and allelic regions of the major merozoite surface protein (gp195) in immunity against *Plasmodium falciparum*., *Infect. Immun.*, 60:1422-1433.
25. Chang, S.P., Gibson, H.L., Lee-Ng, C.T., Barr, P.J. and G.S.N. Hui. 1992. A carboxyl-terminal fragment of *P. falciparum* gp195 expressed by a recombinant baculovirus induces antibodies that completely inhibit parasite growth. *J. Immunol.*, 149:548-555.
26. Hui, G.S.N. and S.P. Chang. 1992. *Plasmodium falciparum*: Induction of biologically active antibodies to gp195 is dependent on the choice of adjuvants. *Exp. Parasitol.*, 75:155-157.
27. Bathurst, I.C., Gibson, H.L., Kansopon, J., Hahm, B.K., Green, K.M., Chang, S.P., Hui, G.S.N., Siddiqui, W.A., Inselburg, J., Millet, P., Quakyi, I.A., Kaslow, D.C., and P.J. Barr. 1993. An experimental vaccine cocktail for *Plasmodium falciparum* malaria. *Vaccine*, 11:449-456.
28. Hui, G.S.N., Hashiro, C., Nikaido, C., Case, S.E., Hashimoto, A., Gibson, H., Barr, P.J., and S. P. Chang. 1993. Immunological cross-reactivity of the C-terminal 42-kilodalton Fragment of *Plasmodium falciparum* Merozoite Surface Protein 1 Expressed in Baculovirus. *Infect. Immun.* 61:3403-3411.
29. Chang, S.P. 1993. Expression systems that best mimic native structure: Which ones to try first and why. *Amer. J. Trop. Med. Hyg.*, 50 (supplement):11.
30. Chang, S.P., Nikaido, C.M., Hashimoto, A.C., Hashiro, C.Q., Yokota, B.T., and G.S.N. Hui. 1994. Regulation of antibody specificity to *P. falciparum* merozoite surface protein 1 (MSP-1) by adjuvant and MHC haplotype., *J. Immunol.*, 152:3483-3490.
31. Al-Yaman, F., Genton, B., Kramer, K., Taraika, J., Chang, S., Hui, G., and Alpers, M. 1995. Acquired antibody levels to *Plasmodium falciparum* merozoite surface antigen 1 in residents of a highly endemic area of Papua New Guinea., *Trans. Roy. Soc. Trop. Med. Hyg.*, 89:555-559.

32. Terrientes, Z.I., Kramer, K., Herrera, S., and Chang, S.P. 1994. Naturally acquired antibodies against the major merozoite surface coat protein (MSP-1) of *Plasmodium falciparum* acquired by residents in an endemic area of Colombia. *Memorias Do Instituto Oswaldo Cruz*, 89:55-61.
33. Hui, G.S.N., Hashimoto, A.C., Nikaido, C.M., Choi, J., and Chang, S.P. 1994. Induction of antibodies to the *Plasmodium falciparum* merozoite surface protein-1 (MSP1) by cross-priming with heterologous MSP1s. *J. Immunol.*, 153:1195-1201.
34. Chang, S.P., Case, S.E., Gosnell, W.L., Hashimoto, A., Kramer, K.J., Tam, L.Q., Hashiro, C.Q., Nikaido, C.M., Gibson, H.L., Lee-Ng, C.T., Barr, P.J., Yokota, B.T., and Hui, G.S.N. 1996. Recombinant baculovirus 42 kDa C-terminal fragment of *P. falciparum* merozoite surface protein-1 protects *Aotus* monkeys against malaria. *Infect. Immun.*, 64:253-261.
35. Al-Yaman, F., Genton, B., Kramer, K., Chang, S., Baisor, M., Hui, G.S.N. and Alpers, MP. 1996. Assessment of the role of serum antibody levels to *Plasmodium falciparum* MSP-1 in protecting Papua New Guinean children from malaria morbidity. *Amer. J. Trop. Med. Hyg.*, 54:443-448.
36. Tine, J.A., Lanar, D.E., Smith, D., Welde, B.T., Schultheiss, .P, Ware, L.A. Kauffman, E.B., Wirtz, R.A., de Taisne, C., Hui, G.S.N., Chang, S.P., Church, P., Hollingdale, M.R., Kaslow, D.C., Hoffman, S., Guito, K.P., Ballou, W.R., Sadoff, J.C., and Paoletti, E. 1996. NYVAC-Pf7: A poxvirus-vectored, multistage vaccine candidate for *Plasmodium falciparum* malaria. *Inf. Immun.* 64:3833-3844.
37. Locher, C.P., Tam, L.Q., Chang, S.P., McBride, J.S., and Siddiqui, W.A. 1996. *Plasmodium falciparum*: gp195 Tripeptide Repeat-Specific Monoclonal Antibody Inhibits Parasite Growth *in vitro*. *Exp. Parasitol.* 84:74-83.
38. Work, T.M., Balazs, G.H., Rameyer, R.A., Chang, S.P., Berestecky, J. 2000. Assessing humoral and cell-mediated immune response in Hawaiian green turtles, *Chelonia mydas*. *Vet. Immunol. & Immunopath.* 74:179-194.
39. Work, T. M., Rameyer, R.A., Balazs, G.H., Cray, C. and Chang, S.P. 2001. Immune status of free-ranging green turtles with fibropapillomatosis from Hawaii. *J. Wildlife Dis.* 37:574-581.
40. Gosnell, W.L., Kramer, K.J., Hashimoto, A., Nishimura, T.A., Vine, B., Kensil, C.R., Van Nest, G., Ganne, V. and Chang, S.P. Immunogenicity of a baculovirus 42 kDa *P. falciparum* merozoite surface protein-1 polypeptide formulated with Stimulon QS-21 and Montanide ISA-51 adjuvants. Submitted, 2003.
41. Yoshida, S., Kobayashi, T., Matsuoka, H., Seki, C., Gosnell, W.L., Chang, S.P., and Ishii, A. T cell activation and cytokine production via a bispecific single-chain antibody fragment targeted to blood-stage malaria parasites. *Blood* 101:2300-6, 2003.
42. Vine, B.G, Bugos, R., Su, W., and Chang, S.P. Expression of a synthetic *Plasmodium falciparum* 42 kDa merozoite surface protein-1 gene with increased G+C content in *Nicotiana tabacum*. Submitted, 2003.
43. Sasser, T.A., Hashimoto, A., and Chang, S.P. *Plasmodium falciparum* merozoite surface protein 1 (MSP-1)/merozoite surface protein 7 (MSP-7) interactions. Submitted, 2003.

INVITED PRESENTATIONS:

Scientific Working Group Meeting: Immunology of Malaria, World Health Organization, Feb. 25-26, 1997, Geneva, Switzerland.

MSP-1 Vaccine Candidates Meeting, World Health Organization, Dec. 17, 1997, Geneva, Switzerland.

TDR Meeting on Malaria and Schistosomiasis: Vaccine Research in Asia, June 1-2, 1999, Manila, Philippines.

Falciparum Malaria MSP-1 Workshop: Progress toward MSP-1 Vaccine Development and Testing, Malaria Vaccine Initiative, Program for Appropriate Technology, Dec. 2, 2000, Bethesda, MA.

3rd Meeting on Novel Adjuvants Currently In/Close to Human Clinical Testing, World Health Organization and Fondation Merieux, Jan. 6-9, 2002, Annecy, France.

4th Meeting on Novel Adjuvants Currently In/Close to Human Clinical Testing, World Health Organization and Fondation Merieux, June 23-25, 2003, Annecy, France.

TEACHING:

Graduate Education

Chair, Tropical Medicine Graduate Program, 1998 to present.

Program Director, Ph.D. training grant: "Interdisciplinary Program in Biology and Engineering" (Graduate Assistance in Areas of National Need Program) funded by Department of Education, 1999 – 2002.

Graduate Faculty Member

Tropical Medicine, 1987 to present.

Biomedical Sciences (CMNS), 1988 to present.

Microbiology, 1998 to present.

Molecular Biosciences & Biosystems Engineering, 2002 to present.

Course Coordinator and lecturer, TRMD 604, Infectious Disease Microbiology I: Bacteriology, Mycology, & Immunology, 1994 to present.

Lecturer, BIOM 622, Cell Molecular Biology II, 1986 to present.

Course coordinator (with Dr. Yamaga, Gosnell), Immunology Journal Club, 1994 to present.

Course coordinator (with Drs. Yamaga, Patek), TRMD 609, Clinical/Advanced Immunology, 2000, 2002.

Lecturer, TRMD 705, Special Topics in Infectious Diseases, 1998 (rotating schedule).

Course Coordinator, TRMD 690, Tropical Medicine Seminar, (rotating schedule).

Research Advisor

Current Students: Todd Sasser (PhD, TRMD), Moti Chapagain (MS, TRMD), Erica Dorman (MS, Micro)

Graduates: Zilka Terrientes (PhD, TRMD), William Gosnell (PhD, TRMD), Ben Vine (PhD, TRMD), Dena Ono (MS, TRMD), Ron Finnegan (MS, Micro), Tani Nishimura (MS, Micro), Raj Shrestha (MS, TRMD)

Thesis Committee Member

Current Students: Gabriel Peckham (PhD, MBBE), Beth Irikura (PhD, MBBE), Jennifer Busto (PhD, MBBE), Fumiyuki Isami (MS, TRMD), Eugene Richardson (MS, TRMD)

Graduates: Chris Locher (PhD, TRMD), Brian Turano (PhD, CMNS), Neil Matsui (PhD, Micro), Carl Sasaki (PhD, Micro), Lenora Loo (PhD, CMNS), Nattawan Promadej (PhD, Micro), Kendra Martyn (PhD, CMNS), Darren Park (PhD, Micro), Jason Isa (MS, Publ Hlth), Christopher Lum (MS, TRMD), Brian Tanabe (MS, TRMD), Etienne Tokonzaba (MS, TRMD), Rachel Omo (MS, TRMD), Rui Lin (PhD, CMNS), Susan Langan (MS, TRMD), Eric Nelson (MS, Micro), Claudia Chang (PhD, Micro), Luci Abe (PhD, TRMD), Amy Keech (MS, TRMD)

External Thesis Examiner

Ng Wang Kit, Chinese University of Hong Kong (MPHIL, Biology)

Medical Education

Medical Student Adviser, 1995 to present.

Medical School Tutor, 1989-90.

Student Standing and Promotion Committee, 1998 to present.

Medical School Admissions Committee, 1995 to 1998.

Medical School Admissions Interviewer, 1995 to present.

Colloquium speaker, BIOM 552, Unit 2, Cardiovascular, Respiratory & Renal Problems, (Microbiology & Immunology), 1996 to present.